

Updated checklist of the Orthoptera of British Columbia.

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ABSTRACT

Since the last publication of a checklist of the Orthoptera of British Columbia, much has been learned about the group. New information has come from a variety of web-based resources as well as new collections. An updated checklist is presented, listing 104 resident species in the province. Two of these species are represented by two subspecies in BC. Eight species have been added since the last list was published, including newly discovered native species and newly established non-native species. Records of six species have been found to be based on misidentified specimens and these species have been deleted from the checklist. An additional 15 species are considered hypothetical and may one day be confirmed to occur in BC.

Key Words: Orthoptera, British Columbia, Checklist

INTRODUCTION

The basis for understanding the Orthoptera of British Columbia (and Canada) is the Agriculture Canada handbook published in 1985 (Vickery and Kevan 1985). While the handbook was in preparation, a number of taxonomic changes were proposed by Otte (1981, 1984). These changes necessitated updates to the information presented in the handbook (Vickery 1987) and the publication of a new checklist (Vickery and Scudder 1987). Since that time, there have been a number of changes in both the taxonomy of the order and the state of knowledge of the provincial insect fauna. The advent of the Orthoptera Species File Online (Eades et. al 2012) has provided easy access to authoritative and up to date taxonomic

information. Other web-based developments, such as the Singing Insects of North America (Walker and Moore 2012), Bugguide (Iowa State University 2003 – 2012), and efauna (Klinkenberg 2012), have provided information to a wider audience and raised the public profile of Orthoptera and other insects. At the same time, submissions to these websites from the naturalist community have provided unusual records and added to our knowledge of the Orthoptera of BC. Recent field collections have also contributed greatly to our understanding of the group. Presented here is an updated checklist of the Orthoptera of BC, with an explanation of changes to the 1987 list.

MATERIALS AND METHODS

Beginning in 2005, the staff and volunteers of the Royal British Columbia Museum (RBCM) have increasingly targeted Orthoptera during field collections. A number of collecting events have specifically focused on Orthoptera in regions of the province known to have high diversity, records of under-collected species, or a lack of historic records. At the same time, the British Columbia Ministry of Environment has collected Orthoptera during insect sampling throughout the southern portion of the

province. Both the RBCM and the Ministry of Environment have been successful in soliciting donations of specimens collected by private companies and community organizations engaged in a variety of biodiversity studies. Examination of specimens from all sources has yielded several new species for the province and has provided new distributional data for more than half of the species now known from BC.

The author has critically examined the Orthoptera collections of the RBCM, the

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Lyman Entomological Museum (Montreal), the Canadian National Collection (Ottawa) and the Royal Ontario Museum (Toronto).

These examinations revealed a number of identification errors and previously unrecognized species.

RESULTS AND DISCUSSION

An updated checklist to the Orthoptera of BC is presented in Table 1.

Taxonomic changes

The following species are listed here differently than in previous checklists. These taxonomic changes are according to Eades *et al.* (2012) unless another source is identified.

Arphia pseudonietana pseudonietana (Thomas 1870) is listed here as *Arphia pseudonietana* (Thomas 1870); no subspecies are recognized.

Chorthippus curtipennis curtipennis (Harris 1835) is listed here as *Pseudochorthippus curtipennis curtipennis* (Harris 1835).

Circotettix rabula rabula Rehn and Hebard 1906 is listed here as *Circotettix rabula* Rehn and Hebard 1906; no subspecies are recognized.

Circotettix undulatus undulatus (Thomas 1872) is listed here as *Circotettix undulatus* (Thomas 1872); no subspecies are recognized.

Melanoplus femurrubrum femurrubrum (De Geer 1773) is listed here as *Melanoplus femurrubrum* (De Geer 1773); no subspecies are recognized.

Melanoplus kennicottii kennicottii Scudder 1878 is listed here as *Melanoplus kennicotti* Scudder 1878; no subspecies are recognized; the spelling is corrected.

Melanoplus occidentalis occidentalis (Thomas 1872) is listed here as *Melanoplus occidentalis* (Thomas 1872); no subspecies are recognized.

Orphulella pelidna desereta Scudder 1899 is listed here as *Orphulella pelidna* (Burmeister 1838); no subspecies are recognized.

Psoloessa delicatula buckelli Rehn 1937 is listed here as *Psoloessa delicatula* (Scudder 1876); no subspecies are recognized.

Sphagniana sphagnorum (F. Walker 1869) is listed here as *Metrioptera sphagnorum* (F. Walker 1869). The species was included in the genus *Metrioptera* in the most recent revision of North American Tettigoniinae (Rentz and Birchim 1968).

Trimerotropis suffusa Scudder 1876 is listed here as *T. verruculata suffusa* Scudder 1876.

Trimerotropis verruculata (Kirby 1837) is listed here as *T. verruculata verruculata* (Kirby 1837).

Xanthippus buckelli Hebard 1928 has been synonymised with *Xanthippus corallipes* (Haldeman 1852).

Additions to the checklist of the Orthoptera of BC

Conocephalus dorsalis (Latreille 1804): A non-native species established in the Fraser Delta (Miskelly, in prep.) (RBCM and UBC specimens).

Meconema thalassinum (De Geer 1773): A non-native species well-established in the Fraser Valley (Cannings *et al.* 2007) and Victoria area (RBCM specimens).

Melanoplus digitifer Hebard 1936: Collected by RBCM in the Selkirk Mountains in 2008. Subsequently, a group of specimens from the same area that had been misidentified as *Melanoplus oregonensis triangularis* Hebard 1928 was found in the Lyman collection. Since 2008, *M. digitifer* has been collected at several locations in BC in the southern Selkirk Mountains (RBCM specimens).

Oedaleonotus enigma (Scudder 1876): Collected in BC (and Canada) for the first time by the BC Ministry of Environment in Osoyoos in 2010 (RBCM specimens).

Orchelimum gladiator Bruner 1891: Though not previously recorded in BC, two specimens were found in existing collections. One specimen in the RBCM collection was collected in Creston in 1991 and identified correctly. The second, found in the UBC collection, was collected in Myncaster in 1998 and misidentified as *Conocephalus fasciatus* (De Geer 1773). Since 2008, *O. gladiator* has been collected at many locations from Christina Lake to Fernie (RBCM specimens).

Steiroxys: This genus is in need of revision and no British Columbian specimens have been identified to species. However, there

Table 1

Checklist of the Orthoptera of British Columbia. I = Introduced species. A = Addition since previous checklist.

Family	Subfamily	Species
Stenopelmatidae	Stenopelmatinae	<i>Stenopelmatus fuscus</i> Haldeman 1852 <i>Stenopelmatus longispinus</i> Brunner von Wattenwyl 1888
Rhaphidophoridae	Ceuthophilinae	<i>Ceuthophilus agassizii</i> (Scudder 1861) <i>Ceuthophilus alpinus</i> Scudder 1894 <i>Ceuthophilus vicinus</i> Hubbell 1936 <i>Pristoceuthophilus celatus</i> (Scudder 1894) <i>Pristoceuthophilus cercalis</i> Caudell 1916 <i>Pristoceuthophilus pacificus</i> (Thomas 1872)
Prophalangopsidae	Tropodischiinae Cyphoderrinae	<i>Tropodischia xanthostoma</i> (Scudder 1861) <i>Cyphoderris buckelli</i> Hebard 1934 <i>Cyphoderris monstrosa</i> Uhler 1864
Tettigoniidae	Conocephalinae Meconematinae Phaneropterinae Tettigoniinae	<i>Conocephalus dorsalis</i> (Latreille 1804) ^{I,A} <i>Conocephalus fasciatus</i> (De Geer 1773) <i>Orchelimum gladiator</i> Bruner 1891 ^A <i>Meconema thalassinum</i> (De Geer 1773) ^{I,A} <i>Scudderia furcata furcata</i> Brunner von Wattenwyl 1878 <i>Scudderia pistillata</i> Brunner von Wattenwyl 1878 <i>Anabrus longipes</i> Caudell 1907 <i>Anabrus simplex</i> Haldeman 1852 <i>Apote robusta</i> Caudell 1907 <i>Metrioptera sphagnorum</i> (F. Walker 1869) <i>Neduba steindachneri</i> (Herman 1874) <i>Peranabrus scabricollis</i> (Thomas 1872) <i>Steiroxys cf. strepens</i> Fulton 1930 ^A <i>Steiroxys cf. trilineata</i> (Thomas 1870) ^A <i>Steiroxys</i> undescribed species ^A
Gryllidae	Gryllinae Oecanthinae Nemobiinae	<i>Acheta domesticus</i> (Linnaeus 1758) ^I <i>Gryllus pennsylvanicus</i> Burmeister 1838 <i>Gryllus veletis</i> (Alexander and Bigelow 1960) <i>Oecanthus argentinus</i> Saussure 1874 <i>Oecanthus californicus californicus</i> Saussure 1874 <i>Oecanthus fultoni</i> T. J. Walker 1962 <i>Oecanthus quadripunctatus</i> Beutenmuller 1894 <i>Oecanthus rileyi</i> Baker 1905 <i>Allonemobius allardi</i> (Alexander and Thomas 1959) <i>Allonemobius fasciatus</i> (De Geer 1773)
Myrmecophilidae	Myrmecophilinae	<i>Myrmecophilus oregonensis</i> Bruner 1884
Acrididae	Gomphocerinae	<i>Aeropedellus clavatus</i> (Thomas 1873) <i>Ageneotettix deorum</i> (Scudder 1876) <i>Amphitornus coloradus coloradus</i> (Thomas 1873) <i>Aulocara elliotti</i> (Thomas 1870) <i>Brunneria brunnea</i> (Thomas 1871) <i>Chloealtis abdominalis</i> (Thomas 1873) <i>Chloealtis conspersa</i> (Harris 1841) <i>Orphulella pelidna</i> (Burmeister 1838) <i>Pseudochorthippus curtippennis curtippennis</i> (Harris 1835)

Family	Subfamily	Species
		<i>Pseudopomala brachyptera</i> (Scudder 1862)
		<i>Psoloessa delicatula</i> (Scudder 1876)
	Melanoplinae	<i>Asemoplus montanus</i> (Bruner 1885)
		<i>Bradynotes obesa caurus</i> Scudder 1897
		<i>Buckellacris chilcotinae chilcotinae</i> (Hebard 1922)
		<i>Buckellacris hispida</i> (Bruner 1885)
		<i>Buckellacris nuda nuda</i> (E. M. Walker 1898)
		<i>Hesperotettix viridis pratensis</i> Scudder 1897
		<i>Melanoplus alpinus</i> Scudder 1897
		<i>Melanoplus bivittatus</i> (Say 1825)
		<i>Melanoplus borealis borealis</i> (Fieber 1853)
		<i>Melanoplus bruneri</i> Scudder 1897
		<i>Melanoplus cinereus cinereus</i> Scudder 1878
		<i>Melanoplus confusus</i> Scudder 1897
		<i>Melanoplus dawsoni</i> (Scudder 1875)
		<i>Melanoplus digitifer</i> Hebard 1936 ^A
		<i>Melanoplus fasciatus</i> (F. Walker 1870)
		<i>Melanoplus femurrubrum</i> (DeGeer 1773)
		<i>Melanoplus foedus foedus</i> Scudder 1878
		<i>Melanoplus huroni</i> Blatchley 1898
		<i>Melanoplus infantilis</i> Scudder 1878
		<i>Melanoplus kennicotti</i> Scudder 1878
		<i>Melanoplus montanus</i> (Thomas 1873)
		<i>Melanoplus occidentalis</i> (Thomas 1872)
		<i>Melanoplus oregonensis oregonensis</i> (Thomas 1875)
		<i>Melanoplus packardii packardii</i> Scudder 1878
		<i>Melanoplus rugglesi</i> Gurney 1949
		<i>Melanoplus sanguinipes sanguinipes</i> (Fabricius 1798)
		<i>Melanoplus washingtonius</i> (Bruner 1885)
		<i>Oedaleonotus enigma</i> (Scudder 1876) ^A
		<i>Phoetaliotes nebrascensis</i> (Thomas 1872)
	Oedipodinae	<i>Arphia conspersa</i> Scudder 1875
		<i>Arphia pseudonietana</i> (Thomas 1870)
		<i>Camnula pellucida</i> (Scudder 1862)
		<i>Chortophaga viridifasciata</i> (DeGeer 1773)
		<i>Circotettix carlinianus</i> (Thomas 1870)
		<i>Circotettix rabula</i> Rehn and Hebard 1906
		<i>Circotettix undulatus</i> (Thomas 1872)
		<i>Conozoa sulcifrons</i> (Scudder 1876)
		<i>Cratypedes lateritius</i> (Saussure 1884)
		<i>Cratypedes neglectus</i> (Thomas 1870)
		<i>Dissosteira carolina</i> (Linnaeus 1758)
		<i>Dissosteira spurcata</i> Saussure 1884
		<i>Metator nevadensis</i> (Bruner 1905)
		<i>Pardalophora apiculata</i> (Harris 1835)
		<i>Spharagemon campestris</i> (McNeill 1901)
		<i>Spharagemon equale</i> (Say 1825)
		<i>Stethophyma gracile</i> (Scudder 1862)
		<i>Stethophyma lineatum</i> (Scudder 1862)
		<i>Trachyrhachys kiowa</i> (Thomas 1872)
		<i>Trimerotropis fontana</i> Thomas 1876

Family	Subfamily	Species
Tetrigidae	Tetriginae	<i>Trimerotropis gracilis</i> (Thomas 1872)
		<i>Trimerotropis pallidipennis</i> (Burmeister 1838)
		<i>Trimerotropis verruculata suffusa</i> Scudder 1876
		<i>Trimerotropis verruculata verruculata</i> (Kirby 1837)
		<i>Xanthippus corallipes</i> (Haldeman 1852)
		<i>Tetrix brunnerii</i> (Bolivar 1887)
		<i>Tetrix ornata occidua</i> Rehn and Grant 1956
		<i>Tetrix ornata ornata</i> (Say 1824)
		<i>Tetrix subulata</i> (Linnaeus 1758)

appear to be three taxonomic and ecological entities in BC, two of which resemble named species. Therefore, the following three names are included in the checklist to represent these three entities:

Steiroxys cf. strepens Fulton 1930: This name refers to populations found in oak woodlands on southern Vancouver Island (RBCM and UBC specimens). These populations resemble those described from western Oregon in both appearance and habitat. They do not resemble any other named species.

Steiroxys cf. trilineata (Thomas 1870): This name refers to populations found in montane to alpine meadows in the Rocky Mountains (RBCM specimens). These populations resemble those described from the southern Rocky Mountains in both appearance and habitat. They do not resemble any other named species.

Steiroxys undescribed species: This name refers to populations found in grasslands of the southern interior (RBCM, UBC, Lyman specimens). They do not resemble any named species.

Deletions from the checklist of the Orthoptera of BC

Anabrus cerciata Caudell 1907: Earlier reports of this species in BC were based on a single misidentified specimen of *A. longipes* Caudell 1907 in the Lyman Entomological Museum.

Anabrus spokan Rehn and Hebard 1920: This species had been included in previous checklists presumptively; no specimens have ever been collected in BC (but see Hypothetical/Expected species below)

Melanoplus oregonensis triangularis – Earlier reports of this species in BC were based on misidentified specimens of *Melanoplus digitifer* in the Lyman

Entomological Museum (see Additions section above).

Oecanthus nigricornis F. Walker 1869: Earlier reports of this species in BC were based on misidentified specimens of *O. quadripunctatus* Beutenmuller 1894 in the Lyman Entomological Museum.

Spharagemon collare (Scudder 1872): Earlier reports of this species in BC were based on misidentified specimens of *Spharagemon equale* (Say 1825) in the Lyman Entomological Museum.

Trimerotropis koebelei (Bruner 1889): Otte (1984) mapped this species as occurring in BC, but described the species as restricted to Oregon and California. No specimens from Canada are known, and the point on the map is assumed to be an error.

Trimerotropis sparsa (Thomas 1875): Earlier reports of this species in BC were based on a single misidentified specimen of *T. gracilis* (Thomas 1872) in the Lyman Entomological Museum.

Hypothetical/ Expected species

The following species are excluded from the BC checklist for lack of unequivocal evidence of either their presence in the province or the taxonomic validity of the species. Some of these species are likely to be confirmed as occurring in BC in the future.

Anabrus spokan Rehn and Hebard 1920: Recorded in northern Idaho and adjacent Washington and may occur in the Creston or Trail areas. However, the original description of this species did not clearly separate it from *A. longipes*, and it may be a synonym.

Brunneria yukonensis (Vickey 1969): This species has been recorded in the southwestern Yukon Territory and may occur in adjacent BC.

Conozoa texana Bruner 1889: Reported by Otte (1984) to occur in BC. The only known

Canadian specimens could not be unequivocally identified and may represent *C. sulcifrons* (Scudder 1876) (Vickery 1987).

Encoptolophus costalis (Scudder 1862): The species has been recorded in the Peace region of Alberta and may occur in adjacent BC.

Melanoplus dodgei (Thomas 1871): This species has been recorded in northern Montana and may occur in the southern part of the British Columbian Rocky Mountains.

Melanoplus frigidus (Boheman 1846): This species has been recorded in coastal Alaska and may occur in extreme northwestern BC.

Melanoplus gladstoni Scudder 1897: This species has been recorded in grasslands of western Alberta and may occur in BC in the southern Rocky Mountains or the Peace Region.

Melanoplus packardii brooksi Vickery 1979: This taxon has been recorded in northern Alberta and may occur in adjacent BC.

Myrmecophilus manni Schimmer 1911: An unidentified *Myrmecophilus* species was collected once near Penticton (specimen at Beatty Biodiversity Museum) and photographed once in Oliver (Iowa State University 2003–2012). These specimens resemble *M. oregonensis* Bruner 1884 morphologically. However, *M. oregonensis* is not known to occur east of the Cascade Mountains (Hebard 1920). The range and habitat for these records are most consistent with published information on *M. manni* (Hebard 1920).

Phlibostroma quadrimaculatum (Thomas 1871): This species has been recorded in western Alberta and may occur in adjacent BC.

Pristoceuthophilus gagei Hubbell 1925: This species was removed from BC checklists

following a suggestion by Hubbell (1985) that it is a synonym of *P. cercalis* Caudell 1916. *P. gagei* is retained here as a hypothetical species because it has never been formally entered into synonymy with *P. cercalis*.

Tessalana tessellata tessellata (Charpentier 1825): This European species was introduced to California (Rentz 1963) and has rapidly spread as far north as the mid latitudes of Washington on both sides of the Cascades (pers. obs.). It is expected to eventually spread into BC in the lower mainland and/or Okanagan Valley.

Trimerotropis cincta (Thomas 1870): Reported by Otte (1984) to occur in BC, but shown as disjunct from the remainder of the species' range. The only known Canadian specimens could not be unequivocally identified, and may represent *T. fontana* (Thomas 1876) (Vickery 1987).

Xanthippus aquilonius Otte 1984: This species was described based on specimens from the Okanagan and Kettle Valleys in BC. However, previous authors have commented on the apparent overlap with *X. coralipes* (Vickery 1987, Vickery and Scudder 1987). *X. aquilonius* is omitted from the checklist with the assumption that it will eventually be synonymised with *X. coralipes*.

Xanthippus brooksi Vickery 1967: This species has been recorded in the southwestern Yukon Territory and may occur in northwestern BC.

Adventive species

A number of foreign species of Orthoptera have been recorded in BC as rare adventives that have not become established and are not a part of the BC fauna. These species are not included in the checklist. Records of adventive species can be found in Vickery and Kevan (1985) and Vickery and Scudder (1987).

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